PROCEEDINGS

OF THE

ROYAL SOCIETY OF EDINBURGH.

1835–36. No. 7.

Monday, 7th December 1835.

Dr HOPE, V. P. in the Chair.

The following Candidates were elected Members of the Society:

James Moncrieff, Esq. Advocate.
John Stewart Wood, Esq.

The following Donations were presented:

An Account of the Rev. John Flamsteed, the first Astronomer-Royal; compiled from his own manuscripts, and other authentic documents never before published. To which is added his British Catalogue of Stars. By Francis Baily, Esq. Vice-President of the Royal Astronomical Society.—*By the Lords Commissioners of the Admiralty.*

Memoirs of the Royal Astronomical Society. Vol. viii.

Astronomical Observations made at the Royal Observatory at Greenwich, under the direction of John Pond, Esq.—for 1829, part 5; 1833, part 5; 1834, parts 1, 2, 3, 4; and 1835, part 1.—*By the Royal Astronomical Society.*

Observations sur le Choléra Morbus qui a régné à la Nouvelle Orleans en 1833 et en 1834, par M. Michel Halphen, M. D.—*By the Author.*

Considerations sur la Nature et le Traitement du Choléra Morbus, suivres d'une instruction sur les preceptes Hygieniques contre

cette Maladie. Par le Chevalier J. R. L. de Kirckhoff, M.D. —*By the Author.*

Bulletin de la Société de Geographie. Deuxieme serie. Tomes i. ii.—*By the Society.*

Bulletin de la Société d'Encouragement pour l'Industrie Nationale. Mai à Decembre 1834, et Janvier à Mars 1835.—*By the Society.*

Leerboek voor Scheikundige Werktuigkunde, door G. J. Mulder. Vol. ii. part 2.—*By the Author.*

Tijdschrift voor Natuurlijke Geschiedenis. Uitgegeven door J. Van der Hoeven, M. D., en W. H. de Vriese, M. D. Vol. i. parts 1, 2, 3.—*By the Editors.*

Geological Report of an Examination made in 1834 of the elevated country between the Missouri and Red Rivers. By G. W. Featherstonhaugh, Esq.—*By the Author.*

Index to the first Eighteen Volumes of the Asiatic Researches, or Transactions of the Society instituted in Bengal for inquiring into the History and Antiquities, the Arts, Sciences, and Literature of Asia.—*By the Society.*

Mémoires d'Agriculture, d'Economie Rurale et Domestique, publiés par la Société Royale et Centrale d'Agriculture. Pour l'année 1834.—*By the Society.*

Memoirs of the American Academy of Arts and Sciences. (New Series.) Vol. i.—*By the Academy.*

Voyage autour du Monde par les Mers de l'Inde et de Chine, éxécuté sur la Corvette de l'Etat La Favorite pendant les années 1830, 1831, et 1832, sous le Commandement de M. La Place, Capitaine de Frégate. 4 tomes.

Voyage de Decouvertes de l'Astrolabe éxécuté par ordre du Roi pendant les années 1826-27-28-29, sous le Commandement de M. J. Dumont d'Urville, Capitaine de Vaisseau. 2 tomes. *Par le Ministre de la Marine de France.*

The Journal of the Royal Asiatic Society of Great Britain and Ireland. No. 4.

Transactions of the Royal Asiatic Society of Great Britain and Ireland. (Appendix to Vol. iii.)—*By the Society.*

Memorias da Academia Real das Sciencias de Lisboa. Vols. i. to xi. part i.

Noticias para a Historia a Geografia das Naçoes Ultramarinas, publicada pela Academia Real das Sciencias. Vols. i. to iv. part 1. *By the Royal Academy of Lisbon.*

Sur l'Homme et le Dèveloppement des ses Facultés, ou Essai de Physique Sociale; par A. Quetelet, Secretaire Perpétuel de l'Academie Royale de Bruxelles, &c. 2 tomes.—*By the Author.*

The Journal of the Asiatic Society of Bengal. Edited by James Prinsep, Esq. F. R. S. Vol. iii.—*By the Editor.*

A Grammar of the Tibetan Language in English. By Alexander Csoma de Körös.

A Dictionary, Tibetan and English. By Alexander Csoma de Körös.—*By the Author.*

Arsberättelse om Framstegen i Fysik och Kemi afgifven den 31 Mars 1833 af Jac. Berzelius, K. V. Acad. Secret.

Kongl. Vetenskaps-Academiens Handlingar för Ars 1827, 1828, and 1831.

Arsberattelser om Vetenskapernas Framsteg, afgifne af Kongl. Vetenskaps Academiens Embetsman 1828 and 1831.—*By the Academy.*

Report of the Fourth Meeting of the British Association for the Advancement of Science, held at Edinburgh in 1834.—*By the Association.*

American Journal of Science and Arts. Conducted by Benjamin Silliman, M. D., LL. D. April 1835.—*By the Editor.*

Catalogue of the Works in Medicine and Natural History contained in the Radcliff Library.—*By Dr Kidd, Librarian.*

Proceedings of the Geological Society of London. Nos. 37. and 38.

Transactions of the Geological Society of London. (Second Series.) Vol. iii. part 3.—*By the Society.*

A Catalogue of 606 principal Fixed Stars in the Southern Hemisphere. By Manuel J. Johnston, Lieutenant St Helena Artillery.—*By the Author.*

The Cyclopædia of Anatomy and Physiology. Edited by Robert B. Todd, M. B., &c. Part 1.—*By the Editor.*

Le Régne Mineral raméné aux Methodes de l'Histoire Naturelle, par L. A. Necker, de l'Academie et de la Société de Physique et d'Histoire Naturelle de Geneve. 2 tomes.—*By the Author.*

Mémoires de la Société de Physique et d'Histoire Naturelle de Geneve. Tome vii. p^{tie}. 1.—*By the Society.*

Natuur-en Scheikundig Archief. Uitgegeven door G. J. Mulder. Jaargang, 1835. Stuk 1.—*By the Author.*

Lettres Cosmologiques, par M. le Comte E. de Montlivault.—*By the Author.*

Nova Acta Physico-Medica Academiæ Cæsareæ Leopoldino-Carolinæ Naturæ Curiosorum. Vol. xvii. part 1.—*By the Academy.*

Quarterly Journal of Agriculture; and Prize Essays and Transactions of the Highland and Agricultural Society of Scotland; for June, September, and December, 1835.—*By the Society.*

A Treatise on Poisons, in relation to Medical Jurisprudence, Physiology, and the Practice of Physic. By Robert Christison, M. D., F. R. S. E., Professor of Materia Medica in the University of Edinburgh, &c. &c.—*By the Author.*

Annual Report of the Council of the Yorkshire Philosophical Society, for 1834.—*By the Society.*

Report of the Directors of the Manchester Mechanics Institution, and Proceedings at the Annual Meeting of the Members, held on 26th February 1835.

Catalogue of the Library of the Manchester Mechanics Institution, with the Rules, and a Sketch of the Objects and Advantages of the Institution.—*By the Institution.*

Journal of the Bahama Society for the Diffusion of Knowledge. May 1835. No. 1.—*By the Society.*

Annual Reports of the Leeds Philosophical and Literary Society for 1833–4 and 1834–5.—*By the Society.*

Maps of the Ordnance Survey of Great Britain, published by the Board of Ordnance. Nos. 1, 2, 13, 34, 35, 36, 37, 41, 42, 43, 44, 45, 46, 47, 48, 53, 54, 55, 56, 57, 58, 61, 62, 64, 65, 69, 70, 73, 83, 84, 85, 86.—*By the Board of Ordnance.*

The following Communications were read:—

1. On the Poisonous Properties of Hemlock, and its lately discovered alkaloid, Conia. By Dr Christison.

The author commenced by stating, that he had repeated the greater part of the analysis of hemlock lately executed by Professor Geiger of Heidelberg, and had obtained precisely the same results. According to his analysis, hemlock contains a peculiar principle, alkaloidal in its nature, but differing from the previously discovered alkaloids in its form, which is that of an oily-like liquid, volatile at a moderate elevation of temperature, and capable of being readily distilled over with water. It neutralizes acids, without however forming crystallizable salts. It contains a considerable

proportion of azote. It quickly undergoes decomposition when exposed to the air, giving out ammonia, and becoming a dark, resinous-like substance.

The discoverer inferred, from a few experiments chiefly made on birds, that this principle, which may be termed *Conia*, from the genus of plant whence it is obtained, possesses active poisonous properties; that it produces coma, convulsions, and depressed action or even paralysis of the heart; and that its poisonous qualities are greatly impaired by combination with acids. The author, however, has been led to conclude, from an extensive set of experiments on the higher orders of animals,—that the effects of Conia on the body are increased rather than diminished by neutralization with an acid, such as the muriatic; that it does not produce coma when administered either free or combined; that it does not act at all on the heart; that it possesses a local irritant action, and that its remote action consists simply in the production of swiftly increasing paralysis of the muscles, ending fatally by asphyxia from palsy of the muscles of respiration. He farther found it to be a poison of exceeding activity, scarcely inferior indeed in that respect to hydrocyanic acid. Two drops applied to a wound, or introduced into the eye of a dog, rabbit, or cat, will sometimes occasion death in ninety seconds; and the same quantity injected in the form of muriate into the femoral vein of a dog killed it in three seconds at farthest. The author added various reasons for doubting the probability of any chemical antidote being discovered; and suggested artificial respiration as the most probable remedy, founding on an experiment in which the heart was maintained in a state of vigorous action for a long time by artificially inflating the lungs.

An abstract was then given of a set of comparative experiments made with extract of hemlock; from which he inferred that the action of hemlock is identical with that of Conia. Very powerful extracts were used, which had been prepared with absolute alcohol from the leaves or seeds. The effects ascribed by some toxicological authors to hemlock were not observed; but simply paralysis, with intermittent slight convulsions. From this identity of action it may be concluded, that Conia is really the active principle of hemlock, or at least contains it in large quantity, and is not the product of chemical action and new arrangements of elements.

Some remarks were appended as to the probable nature of the State-poison used in ancient times, particularly in Athens, for despatching criminals; which has commonly been held to be a prepa-

ration of the same plant with the modern *Conium maculatum*. The author shewed, from the descriptions of the Greek κωνειον and Roman *cicuta*, that this plant could not be the modern *conium*; that the account given by Plato of the effects of the state-poison in the case of Socrates is wholly at variance with the description by Nicander and others of the action of the κωνειον; that the effects ascribed to the poison in Plato's narrative are such as no poison whatever which is known at present can produce; and that consequently either Plato's description is an embellished narrative, or the ancients were familiar with a poison of most remarkable and peculiar properties, with which modern toxicologists are no longer acquainted.

2. The reading of a paper on the Geology of Auvergne, by Professor Forbes, was commenced.

Monday, 21*st December* 1835.

Dr HOPE, V. P. in the Chair.

The following Donations were presented:

Address delivered in the Hall of Marischal College, Aberdeen, 5th November 1835, on occasion of his Installation as Lord Rector of the University, by John Abercrombie, M. D. Oxon and Edinburgh, V. P. R. S. E. &c. &c.—*By the Author.*

Astronomische Nachrichten. Nos. 268. to 288.—*By M. Bessel.*

Natuur-en Scheikundig Archief. Uitgegeven door G. J. Mulder. 1835, stuk iii.—*By the Editor.*

Proceedings of the Royal Society of London. Nos. 19. and 20.

Transactions of the Royal Society of London, 1835. Part 1.—*By the Royal Society.*

Geometrical Investigations concerning the Phenomena of Terrestrial Magnetism. By Thomas Stephens Davies, Esq. F. R. S. L. & E.—*By the Author.*

Proceedings of the Geological Society of London. Nos. 40. and 41.—*By the Society.*

Bulletin de l'Academie Royale des Sciences et Belles Lettres de Bruxelles. 1834, Nos. 25, 26, 27; and 1835, Nos. 1, 2, 3.

Annuaire de l'Academie Royale des Sciences et Belles Lettres de Bruxelles.—*By the Academy.*

Annuaire de l'Observatoire de Bruxelles pour l'an 1835. Par le Directeur A. Quetelet.—*By the Author.*

A Treatise on Insects. By James Wilson, Esq. F. R. S. E.

A Treatise on Fishes. By James Wilson, Esq. F. R. S. E.—*By the Author.*

De l'Influence de la Lune sur l'Atmosphere Terrestre, déterminée par les Observations Meteorologiques. Par M. Eug. Bouvard. —*By the Author.*

Memorias para a Historia das Navagaçoes e Descobrimentes das Portuguezes. Par Joaquim José Da Costa De Macedo.—*By the Author.*

A Collection of Specimens from the Volcanic District of Auvergne. —*Collected and presented by Professor Forbes.*

The following Communications were read :—

1. Notes on the Geology of Auvergne, particularly in connection with the Origin of Trap-Rocks and the Elevation Theory. By Professor Forbes. Concluded.

The *first* part of this paper (which accompanied a series of geological specimens from Auvergne, presented to the Society) relates to several specific points which tend to assimilate the evidence for the igneous origin of trap-rocks generally, with that afforded by the volcanic district of Central France. The altered character of the stratified deposits with which igneous rocks have been intermixed, is one of their most striking features; yet we occasionally find cases where this evidence is far from being so obvious as might be expected; and this dubious character, which is particularly remarked in the hill of Gergovia, near Clermont, forms an admirable parallel to some cases in trap districts where a like want of alteration occurs.

The mineral character of the rocks of Auvergne admits of almost perfect identification in a majority of cases with that of undoubted trap-rocks; and we may employ the formations of Central France as a medium of comparison between trap-rocks generally, and modern volcanos, from which the formations of the Monts Dôme are undistinguishable. The trachytes of the Mont Dor and Cantal find their counterparts in the districts of the Siebengebirge and Laacher-Lee. Various points of structure were noticed as important, especially the columnar forms of lavas, geologically

speaking, modern, which has been often referred to; and more remarkably the union of the tabular, with the polygonal columnar structure, exhibited in the undoubtedly igneous trachytes, basalts, and phonolites of the Mont Dor, which are sometimes so extensively slaty as almost to assume the appearance of stratified rocks. The very remarkable passage of one rock into another differing in mineral character and structure was also pointed out, and hence the difficulty of pronouncing conclusively upon the relative age of such rocks.

The *second* part of the paper referred to Von Buch's Theory of Elevation-Craters, and professed to give simply the impression made upon the author's mind by an examination of the specific cases of the groups of the Cantal and Mont Dor, which have been quoted as examples in support of that theory. Various views of the subject were presented, from which the author is disposed to conclude decidedly in favour of the Elevation Theory in these particular cases. The arguments were drawn chiefly from the forms and magnitude of the valleys, and the relation of the beds of igneous rock to one another, in which the valleys are formed. The author expresses some doubt as to the utility of the calculations entered into with regard to this question by MM. Elie de Beaumont and Dufrenoy, and especially as regards the complicated system of the Mont Dor, of which he considers it almost hopeless to unravel the manifold revolutions. In general, however, he coincides in the conclusions arrived at by those authors.

2. Notice of a New Compound of Sulphur, which is probably a Sulphuret of Nitrogen. By Dr Gregory.

This substance, obtained among the products of the reaction of chloride of sulphur on a solution of ammonia, is a solid, colourless, insoluble in water, soluble in alcohol, crystallizing in cubes. It is characterized by producing a fine, but fugitive purple colour, when brought into contact with potash and alcohol.

Dr Gregory obtained from it between 92 and 93 per cent. of sulphur, and from 6 to 7 per cent. of nitrogen.

3. On another New Compound of Sulphur, analogous to the Mercaptan of Zeise. By the same.

The remarkable substance termed by its discoverer, Mercaptan,

may be viewed as alcohol, the oxygen of which has been replaced by sulphur, as in the following formulæ:

$C_4\ H_6\ O_2$ = Alcohol. $C_4\ H_6\ S_2$ = Mercaptan.

The pyroxylic spirit of Dumas and Peligot being extremely analogous to alcohol, Dr Gregory examined whether this analogy extended to the production of a compound analogous to Mercaptan; and, by substituting pyroxylic spirit for alcohol, he obtained this compound, which, although in most of its properties closely resembling mercaptan, is distinguished from it by a greater degree of volatility, boiling at 70° F., while mercaptan boils at 185° F. The following formulæ exhibit the composition of the pyroxylic spirit, according to Dumas and Peligot, and the probable composition of the new liquid:

$C_2\ H_4\ O_2$ = Pyroxylic Spirit. $C_2\ H_4\ S_2$ = New Liquid.

The new liquid has, like mercaptan, a most insupportable alliaceous odour, and exercises an action on red oxide of mercury similar to that from which the name Mercaptan is derived.

4. On a curious Phenomenon observed in the Island of Cephalonia, and on the proximate cause of Earthquakes in the Ionian Islands. By Dr John Davy. Communicated in a letter to Professor Forbes.

Dr Davy communicates the description of certain streams of sea-water which appear to be constantly flowing into the interior of the earth, by four openings, near the town of Argostoli, in Cephalonia. These are now applied as sources of mechanical power. Dr Davy views this curious fact as probably related to the very remarkable local earthquakes which affect the Ionian Islands, and which appear to be disconnected with any volcanic appearances, or even the occurrence of trap-rocks. Dr Davy conceives that these phenomena may be attributable to the absorption of this quantity of sea-water constantly received into the land by the marly beds which occur in Cephalonia. This absorption, Dr Davy concludes from direct experiment, may produce an enlargement of the volume of the marl. This supposition is supported by the remarkable fact, that, in the Ionian Islands generally, these earthquakes occur entirely in the low and marly parts of those islands, and never in those parts connected with solid rock.

Monday, 4th January 1836.

SIR THOMAS M. BRISBANE, President, in the Chair.

The following Donations were presented:—

Mémoires de la Société Geologique de France. Tome i. part 1.

Bulletin de la Société Geologique de France. Tome vi. Feuilles 5–20.—*By the Society.*

Nouvelles Annales du Museum d'Histoire Naturelle. Tome iv. Liv. 2 and 3.—*Par les Editeurs.*

The following Communications were read:—

1. Some Observations on Atmospherical Electricity. By Dr John Davy, F. R. S. Communicated by Professor Forbes.

This paper, tending to establish the chemical action of atmospherical electricity, is based upon experiments made in Malta between October 1834 and March 1835. The mode of operating was the following: A tube of glass containing a wire of copper was elevated six feet in all above a turret in Dr Davy's house in Valletta, which rose just fifty feet from the street. It was not in the highest part of the town, and was overtopped by other buildings. To the lower part of the copper-wire was attached one of gold. The communication to the ground was effected through the medium of another copper-wire, connected with a leaden cistern. Between these two portions of the line of communication from the sky to the ground was interposed the decomposing apparatus, consisting of a tube containing iodide of potassium mixed with starch, and into which two platinum wires were inserted, until within one-fourth inch of being in contact. It was found that, with this arrangement, decomposition was generally going forward even in fine weather,—that it increased in windy or cloudy weather, and especially during the continuance of the sirocco or S. E. wind. During thunder storms, showers of hail, and also of rain, the effect was notably increased.

A deposition of iodine was frequently observed on *both* wires, which Dr Davy attributes to successive changes in the electrical state of the passing clouds. Dr Davy was only once able to obtain distinct indications of the decomposition of water; in that case a strong solution of salt was employed, and fine sewing needles coated with sealing-wax, except at the points, were used as con-

ductors. That these effects were not owing to any electro-chemical action at the junction of the copper and gold conductors was proved by substituting gold throughout.

Dr Davy very rarely succeeded in affecting a galvanometer by atmospheric electricity; nor did he succeed in changing the colour of chloride of silver by the light of the most brilliant thunder-storms, as Mr Brande is believed to have done by voltaic electricity.

On the whole, Dr Davy coincides with Mr Faraday in considering atmospheric electricity as intermediate in its nature between common electricity and that of the pile.

2. Essay towards establishing the Primary Properties of Parallel Lines. By Mr W. Nichol.

The object of the author in this paper was to find a new method of avoiding Euclid's assumptions in the theory of parallel lines. This he endeavours to do by proving that lines making equal angles with a given line cannot recede from one another; but he does not effect this without the introduction of the consideration of infinitely small spaces.

Monday, 18*th January* 1836.

Right Hon. LORD GREENOCK, V. P. in the Chair.

The following Candidates were elected Members of the Society:—

William Paul, Esq.
Robert Paul, Esq.

The following Donations were presented:

The American Journal of Sciences and Arts, conducted by Benjamin Silliman, M. D., LL. D. Vol. xxix. No. 1. (October 1835.)—*By the Editor.*

Flora Batava. Nos. 100, 101, 102, and 103.—*By the King of Holland.*

Neue Wirbelthiere zu der Fauna von Abyssinien gehörig entdeckt und beschrieben von Dr Eduard Rüppell. 4 parts.—*By the Author.*